

Introduction/Business Problem

An IT professional from India has come to New York City in US for a project assignment. He wants to have Indian food over the weekend. The aim is to recommend him places in New York City, Manhattan area, where he can find Indian restaurants

Target Audience: IT professional from India in New York City US in search of Indian restaurant

Data

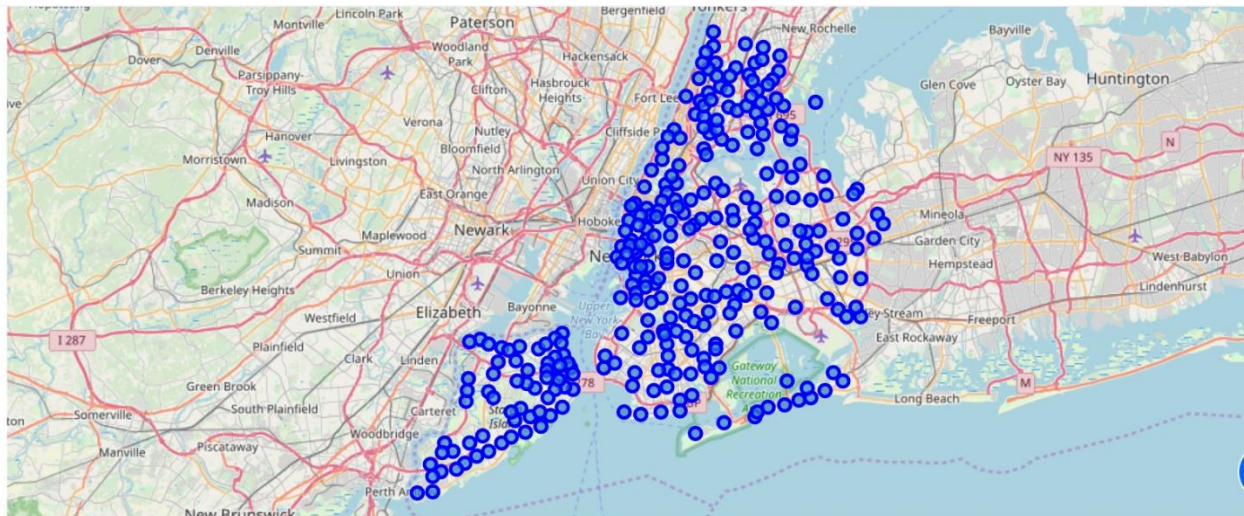
Below data sources will be utilized for this project

1. New York City neighborhood data set will be required to solve the problem statement in hand. The data will be extracted from the link https://geo.nyu.edu/catalog/nyu_2451_34572
2. Foursquare APIs will be used to explore the New York City neighborhood data set

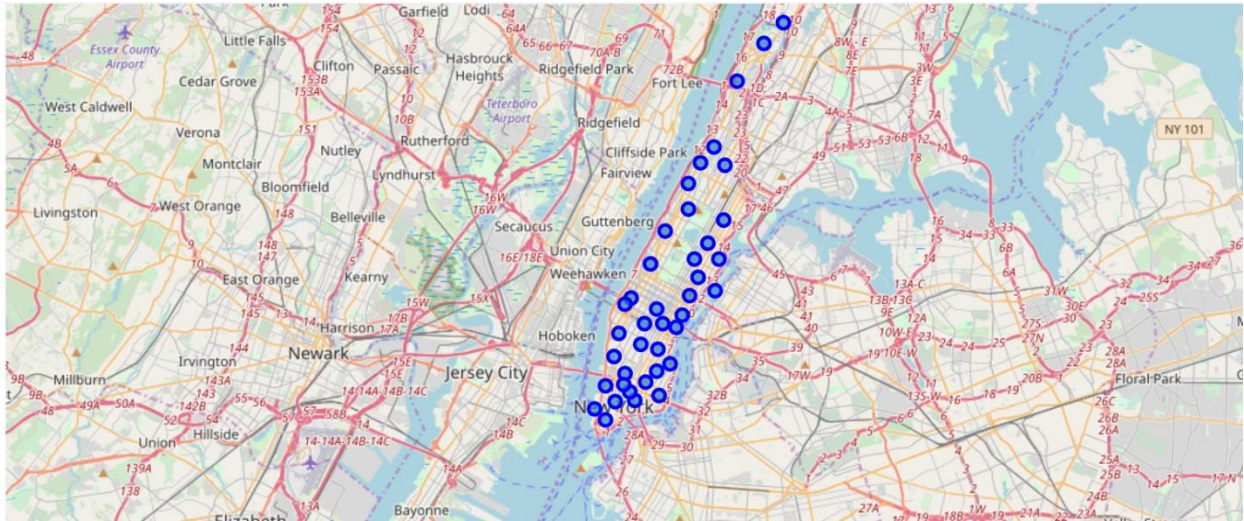
Methodology

Exploratory Data Analysis:- Data downloaded from New York City neighborhood data set lying at the location https://geo.nyu.edu/catalog/nyu_2451_34572 for exploration.

New York City map with Neighborhood superimposed: - Below is the screenshot of New York City map with neighborhoods on top of it.

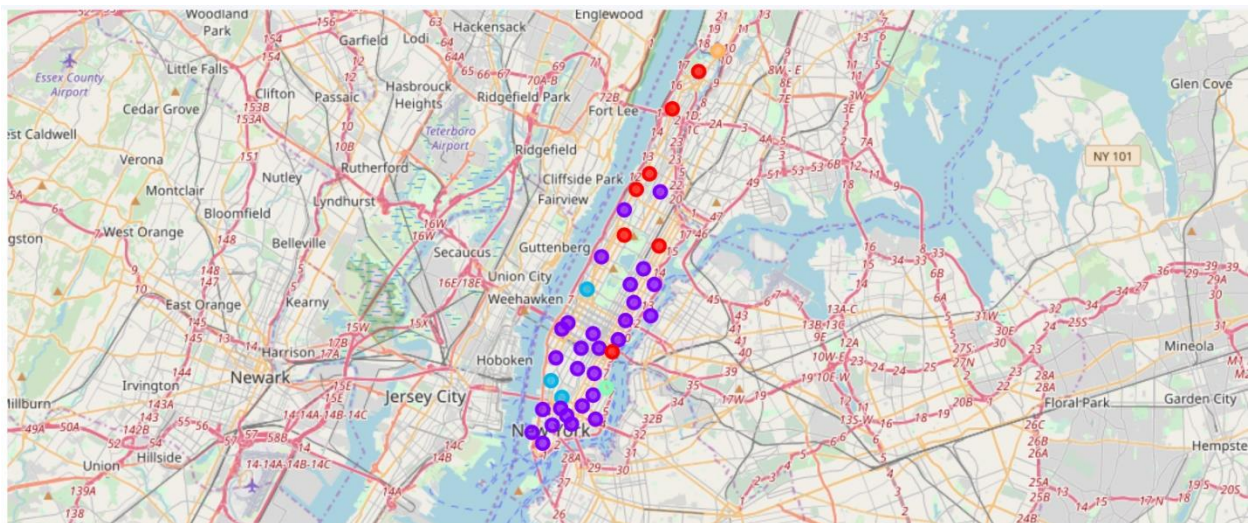


Manhattan Area map with Neighborhood superimposed:- Below is the screenshot of Manhattan map with neighborhoods on top of it.



Foursquare:- Foursquare has been used for exploring the neighborhood of Manhattan in New York City of the US.

Machine Learning using K Clustering algorithm:- K clustering machine learning algorithm has been used to cluster the Manhattan neighborhood venues. 5 clusters were formulated. Below is the screenshot of clustered map.



Results

Below are the screenshots of 5 clusters:

Cluster1

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	Washington Heights	Café	Grocery Store	Deli / Bodega	Bakery	Spanish Restaurant	Mobile Phone Shop	Donut Shop	Bank	Tapas Restaurant	New American Restaurant
3	Inwood	Mexican Restaurant	Restaurant	Lounge	Pizza Place	Café	Deli / Bodega	Bakery	Spanish Restaurant	Frozen Yogurt Shop	Chinese Restaurant
4	Hamilton Heights	Pizza Place	Deli / Bodega	Coffee Shop	Café	Mexican Restaurant	Yoga Studio	Bakery	Liquor Store	Park	Cocktail Bar
5	Manhattanville	Coffee Shop	Deli / Bodega	Italian Restaurant	Mexican Restaurant	Chinese Restaurant	Park	Seafood Restaurant	Cosmetics Shop	Supermarket	Boutique
7	East Harlem	Mexican Restaurant	Bakery	Latin American Restaurant	Thai Restaurant	Deli / Bodega	Spanish Restaurant	Spa	Beer Bar	Grocery Store	Taco Place
25	Manhattan Valley	Bar	Pizza Place	Indian Restaurant	Coffee Shop	Mexican Restaurant	Playground	Yoga Studio	Furniture / Home Store	Clothing Store	Cosmetics Shop
36	Tudor City	Mexican Restaurant	Park	Café	Greek Restaurant	Diner	Pizza Place	Coffee Shop	Deli / Bodega	Asian Restaurant	Gym

Cluster 2

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	Chinatown	Chinese Restaurant	Cocktail Bar	Vietnamese Restaurant	American Restaurant	Bakery	Optical Shop	Spa	Salon / Barbershop	Hotpot Restaurant	Malay Restaurant
6	Central Harlem	Chinese Restaurant	American Restaurant	Seafood Restaurant	Bar	Cosmetics Shop	French Restaurant	African Restaurant	Deli / Bodega	Gym	Market
8	Upper East Side	Italian Restaurant	Exhibit	Art Gallery	Bakery	Coffee Shop	Gym / Fitness Center	Juice Bar	Hotel	French Restaurant	Yoga Studio
9	Yorkville	Italian Restaurant	Coffee Shop	Gym	Bar	Deli / Bodega	Pizza Place	Sushi Restaurant	Wine Shop	Mexican Restaurant	Japanese Restaurant
10	Lenox Hill	Italian Restaurant	Coffee Shop	Pizza Place	Sushi Restaurant	Cocktail Bar	Burger Joint	Gym	Gym / Fitness Center	Café	Cycle Studio
11	Roosevelt Island	Park	Sandwich Place	Playground	Scenic Lookout	Gym / Fitness Center	Gym	Liquor Store	Coffee Shop	Outdoors & Recreation	School
12	Upper West Side	Italian Restaurant	Wine Bar	Bar	Café	Coffee Shop	Indian Restaurant	Mediterranean Restaurant	Bakery	Dessert Shop	Ice Cream Shop
14	Clinton	Theater	Italian Restaurant	Gym / Fitness Center	Coffee Shop	American Restaurant	Hotel	Spa	Sandwich Place	Gym	Lounge
15	Midtown	Hotel	Coffee Shop	Sporting Goods Shop	Clothing Store	Bakery	Steakhouse	French Restaurant	Café	Cocktail Bar	Bookstore

16	Murray Hill	Sandwich Place	Coffee Shop	American Restaurant	Japanese Restaurant	Hotel	Italian Restaurant	Gym / Fitness Center	Spa	Bagel Shop	Burger Joint
17	Chelsea	Coffee Shop	Bakery	Italian Restaurant	Wine Shop	Hotel	Ice Cream Shop	Theater	American Restaurant	Cocktail Bar	Market
19	East Village	Bar	Ice Cream Shop	Wine Bar	Chinese Restaurant	Cocktail Bar	Mexican Restaurant	Pizza Place	Korean Restaurant	Ramen Restaurant	Italian Restaurant
20	Lower East Side	Art Gallery	Pizza Place	Japanese Restaurant	Bakery	Cocktail Bar	Chinese Restaurant	Coffee Shop	Ramen Restaurant	Café	Clothing Store
21	Tribeca	American Restaurant	Park	Italian Restaurant	Spa	Café	Wine Shop	Wine Bar	Coffee Shop	Greek Restaurant	Playground
22	Little Italy	Bakery	Café	Bubble Tea Shop	Sandwich Place	Salon / Barbershop	Mediterranean Restaurant	Cocktail Bar	Italian Restaurant	Seafood Restaurant	Pizza Place
23	Soho	Clothing Store	Boutique	Shoe Store	Art Gallery	Women's Store	Furniture / Home Store	Sporting Goods Shop	Bakery	Italian Restaurant	Men's Store
26	Morningside Heights	Park	American Restaurant	Coffee Shop	Bookstore	Sandwich Place	Deli / Bodega	Burger Joint	Ethiopian Restaurant	Grocery Store	Tennis Court
27	Gramercy	Italian Restaurant	Bar	Pizza Place	Bagel Shop	Thai Restaurant	Mexican Restaurant	Grocery Store	Thrift / Vintage Store	Coffee Shop	Cocktail Bar
28	Battery Park City	Park	Coffee Shop	Hotel	Shopping Mall	Women's Store	Gym	Memorial Site	Food Court	Men's Store	Italian Restaurant
29	Financial District	Coffee Shop	American Restaurant	Bar	Gym	Pizza Place	Gym / Fitness Center	Hotel	Food Truck	Steakhouse	Event Space
30	Carnegie Hill	Coffee Shop	Pizza Place	Café	Yoga Studio	Cosmetics Shop	Grocery Store	Gym	Bakery	Japanese Restaurant	French Restaurant
31	Noho	French Restaurant	Italian Restaurant	Hotel	Art Gallery	Cocktail Bar	American Restaurant	Gift Shop	Coffee Shop	Rock Club	Grocery Store
32	Civic Center	Coffee Shop	Gym / Fitness Center	Hotel	French Restaurant	Yoga Studio	Park	Bakery	Sandwich Place	Cocktail Bar	Spa
33	Midtown South	Korean Restaurant	Hotel	Hotel Bar	Japanese Restaurant	Dessert Shop	Cosmetics Shop	Gym / Fitness Center	Coffee Shop	American Restaurant	Steakhouse
34	Sutton Place	Gym / Fitness Center	Furniture / Home Store	Gym	Italian Restaurant	Coffee Shop	Indian Restaurant	Yoga Studio	Beer Garden	Grocery Store	Beer Bar
35	Turtle Bay	Italian Restaurant	Coffee Shop	Sushi Restaurant	Steakhouse	Wine Bar	Hotel	Ramen Restaurant	Indian Restaurant	Café	Japanese Restaurant
38	Flatiron	Yoga Studio	Japanese Restaurant	American Restaurant	Café	Gym / Fitness Center	Dessert Shop	Cycle Studio	Cosmetics Shop	New American Restaurant	Coffee Shop
39	Hudson Yards	American Restaurant	Hotel	Italian Restaurant	Café	Gym / Fitness Center	Coffee Shop	Thai Restaurant	Spanish Restaurant	Gym	Bar

Cluster 3

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
13	Lincoln Square	Plaza	Café	Theater	Italian Restaurant	Concert Hall	Performing Arts Venue	Indie Movie Theater	American Restaurant	Gym / Fitness Center	Park
18	Greenwich Village	Italian Restaurant	Clothing Store	Café	Sushi Restaurant	French Restaurant	Indian Restaurant	Seafood Restaurant	Dessert Shop	Caribbean Restaurant	Boutique
24	West Village	Italian Restaurant	New American Restaurant	Cosmetics Shop	American Restaurant	Park	Wine Bar	Cocktail Bar	Coffee Shop	Jazz Club	Bakery

Cluster 4

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
37	Stuyvesant Town	Boat or Ferry	Park	Bar	Baseball Field	Pet Service	Gas Station	German Restaurant	Farmers Market	Gym / Fitness Center	Harbor / Marina

Cluster 5

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Marble Hill	Sandwich Place	Gym	Coffee Shop	Kids Store	Steakhouse	Miscellaneous Shop	Supplement Shop	Shopping Mall	Seafood Restaurant	Tennis Stadium

Discussions

Cluster 2:-

1. Indian restaurant is the 6th most common venue in Upper West Side Neighborhood of Manhattan
2. Indian restaurant is the 6th most common venue in Sutton Place Neighborhood of Manhattan
3. Indian restaurant is the 8th most common venue in Turtle Bay Neighborhood of Manhattan

Cluster 3:-

1. Indian restaurant is the 6th most common venue in Greenwich Village Neighborhood of Manhattan

Conclusion

From the Results and Discussions section, we conclude that the IT professional from India can go to below neighborhoods for eating his dinner at an Indian restaurant:

1. Upper West Side – 6th most common venue
2. Sutton Place – 6th most common venue
3. Turtle Bay – 8th most common venue
4. Greenwich Village – 6th most common venue